w.e.f. 2016-2017 Academic Year

SCHOOL OF PHARMACY

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS
(AUTONOMOUS)
Khanapur (V), Ibrahimpatnam, R.R.Dist.- 501506

ACADEMIC REGULATIONS 2016 UNDER - CBCS for B.Pharm. PROGRAMMES

(Effective for the students admitted into I year from the Academic Year **2016-17** onwards)

1.0 Under-Graduate Degree Programme (UGP) in Engineering & Technology / Pharmacy

GNITC offers 4 Year (8 Semesters) **Bachelor of Pharmacy** (B.Pharm.) Degree Programme and **Bachelor of Pharmacy** (B.Pharm) under **Choice Based Credit System** (CBCS) with effect from the Academic Year 2016 - 17 onwards, in the following disciplines.

2.0 Eligibility for Admission

2.1 Admission to the UGP shall be made either on the basis of the merit rank obtained by the qualifying candidate at an Entrance Test conducted by the Telangana State Government (EAMCET) OR on the basis of any other order of merit approved by the State Council of Higher Education, subject to reservations as prescribed by the Government from time to time.

2.2 The medium of instructions for the entire UGP in will be ENGLISH only.

3.0 B.Pharm Programme (UGP) Structure

3.1 The B.Pharm Programme (UGP) of GNITC are of Semester Pattern with 4 Academic years with two semesters. Pattern with 8 Semesters constituting 4 Academic Years, each Academic Year having TWO Semesters (First/Odd and Second / Even Semesters). Each Semester shall be of 22 weeks duration (inclusive of examinations) with a minimum of 90 days of instruction per semester.

3.2 UGC / AICTE specified Definitions/ Descriptions are adopted appropriately for

various terms and abbreviations used in these Academic Regulations/ Norms, which are as listed below.

3.2.1 Semester Scheme:

Each UGP is of 4 Academics Years (8 Semesters), with the year being divided into two Semesters of 22 weeks (≥ 90 working days) each, each Semester having - 'Continuous Internal Evaluation (CIE)' and 'Semester End Examination (SEE)'. Choice Based Credit System (CBCS) and Credit Based Semester System (CBSS) as denoted by UGC, and Curriculum/ Course Structure as suggested by AICTE are followed.

3.2.2 Credit Courses:

All Subjects/Courses are to be registered by a student in a semester to earn credits. Credits shall be assigned to each Subject/Course in a L: T: P: C (Lecture Periods: Tutorial Periods: Practical Periods: Credits) Structure, based on the following general pattern.

- One Credit – for One period/Week/Semester for Theory/Lecture (L) Courses;
- Two Credits – for three periods/Week/Semester for Laboratory / Practical (P) Courses. Other students activities like NCC, NSS, NSO, Study Tour, Guest Lecture etc., and identified Mandatory Courses will not carry Credits.

3.2.3 Subject/ Course Classification:

All Subjects/ Courses offered for the UGP are broadly classified as: (a) Foundation Courses (FnC), (b) Core Courses (CoC), and (c) Elective Courses (EℓC).

- Foundation Courses (FnC) are further categorized as:
(i) HS (Humanities and Social Sciences), (ii) BS (Basic Sciences), and (iii) ES (Engineering Sciences);

-Core Courses (CoC) and Elective Courses (EℓC) are categorized as PS (Professional Subjects), which are further subdivided as – (i) PC (Professional/ Departmental Core) Subjects, (ii) PE (Professional/ Departmental Electives) , (iii) OE (Open Electives); and (iv) Project Works (PW);

-Minor Courses (1 or 2 Credit Courses, belonging to HS/ BS/ ES/ PC as per relevance); and - Mandatory Courses (MC - non-credit oriented).

3.2.4 Course Nomenclature:

The Curriculum Nomenclature or Course-Structure Grouping for the each of the UGP E&T (B.Pharm. Degree Programmes), is as listed below (along with AICTE specified % Range of Total Credits)..

S.NO	Broad Course Classification	Course Group/ Category	Course Description	Range of Credits
1)	Foundation Courses (FnC)	BS-Basic Sciences	Includes – Mathematics, Physics and Chemistry Subjects	15% - 20%
2)		ES-Engineering Sciences	Includes fundamental engineering subjects	15% - 20%
3)		HS- Humanities and Social Sciences	Includes Subjects related to Humanities, Social Sciences and Management	5% - 10%
4)	Core Courses (CoC)	PC- Professional Core	Includes Core subjects related to the parents Discipline/ Department/ Branch of Engg.	30% - 40%
5)		PE- Professional Electives	Includes Elective subjects related to the Parent Discipline / Department/ Branch of Engg.	10% - 15%
6)		OE- Open Electives	Electives subjects which include inter-disciplinary subjects or subjects in an area outside the Parent Discipline/ Department/ Branch of Engg.	5% - 10%
7)	Core Courses	Project Work	B.Pharm / B.Pharm Project or UG Project or UG Major Project	10% - 15%
8)		Industrial Training/ Mini – Project	Industrial Training/ Internship/ UG Mini-Project / Mini-Project	
9)		Seminar	Seminar/ Colloquium based on core contents related to Parent Discipline/ Department/ Branch of Engg.	
10)		Minor Courses	1 or 2 Credits Courses (subset of HS)	Included
11)		Mandatory Courses	Mandatory Courses (non-Credit)	
Total Credits for UGP (B.Pharm) Programme				**192** (100%)

4.0 Course Work

4.1 A student, after securing admission, shall pursue the B.Pharm. / B.Pharm UGP in a minimum period of 4 Academic Years, and a maximum period of 8 Academic Years (starting from the Date of Commencement of I Year).

4.2 Each student shall Register for and Secure the specified number of Credits required for the completion of the UGP and Award of the B.Pharm.

4.3 Each Semester is structured to provide typically varying between 24 and 28 Credits, totaling to 192 Credits for the entire UG Programme.

5.0 Course Registration

5.1 A 'Faculty Advisor or Counselor' shall be assigned to each student, who will advise him/her about the UGP, its Course Structure and Curriculum, Choice/Option for Subjects/ Courses, based on his competence, progress, pre-requisites and interest.

5.2 Academic Section of the College invites 'Registration Forms' from students apriority (before the beginning of the Semester), through 'ON-LINE SUBMISSIONS' or Hard Copy Submission, ensuring 'DATE and TIME Stamping' the ON-LINE or Hard Copy Registration Requests for any 'CURRENT SEMESTER' shall be completed BEFORE the commencement of SEEs (Semester End Examinations) of the 'PRECEDING SEMESTER'.

5.3 A Student can apply for ON-LINE or Hard Copy Registration, only after obtaining the 'written approval' from this Faculty Advisor, which should be submitted to the college Academics Section through the Head of Department (a copy of the same being retained with Head of Department, Faculty Advisor and the student).

5.4 A Student may be permitted to Register for his Subjects/ Course of CHOICE with a typical total of 24 Credits per Semester (Minimum being 20 C and Maximum being 28 C), based on his PROGRESS and SGPA/ CGPA, in the Department Course Structure and Syllabus contents, However, a MINIMUM of 20 Credits per Semester must be registered to ensure the 'STUDENTSHIP' in any Semester.

5.5 Choice for 'additional Subjects/ Courses' to reach the Maximum Permissible Limit of 28 Credits (above the typical 24 Credits norms) must be clearly indicated, which needs the specific approval and signatures of the Faculty Advisor/ Counselor and concerned Head of the Department.

5.6 If the Students submit ambiguous choices or multiple options or erroneous

entries – during ON-LINE or Hard Copy Registration for the Subject(s)/ Course(s) under a give/ specified Course Group/ Category as listed in the Course in that Category only the first mentioned subject/Course in that Category will be taken into consideration.

5.7 Subject/ Course Options exercised through ON-LINE or Hard Copy Registration are final and CAN NOT be changed, and CAN NOT be inter-changed; further, alternate choices will also not be considered. However, if the Subject/ Course that has already been listed for Registration (by the Head of Department) in a Semester could not be offered due to any unforeseen or unexpected reasons, then the Student shall be allowed to have alternate choice - either for a new Subject (subject to offering of such a Subject), or for another existing Subject (subject to availability of seats), which may be considered. Such alternate arrangements will be made by the Head of Department, with due notification and time-framed schedule, within the WEEK from the commencement of Class-work for that Semester.

5.8 Dropping of Subjects/ Courses may be permitted, ONLY AFTER obtaining prior approval from the Faculty Advisor (subject to retaining a minimum of 20 C), "within 7 Days of Time'" from the beginning of the current Semester.

5.9 For Mandatory Courses like NCC/ NSS/ NSO etc., a 'Satisfactory Participation Certificate' from the concerned authorities for the relevant semester is essential. No Marks or Grades or credits shall be awarded for these activities.

6.0 Subjects / Courses to be offered

6.1 A typical Section (or Class) Strength for each Semester shall be 60.

6.2 A subject/Course may be offered to the Students, ONLY IF a Minimum of 20 Students (1/3 of the Section Strength) opt for the same. The Maximum Strength of a Section is limited to 80 (60 + 1/3 of the Section Strength).

6.3 More than ONE TEACHER may offer the SAME SUBJECT (Lab./ Practical may be included with the corresponding Theory Subject in the same Semester) in any Semester. However, selection choice for students will be based on - 'FIRST COME FIRST SERVE' Basis and CGPA Criterion' (i.e., the first focus shall be on early ON-line ENTRY from the students for Registration in that Semester, and the second focus, if needed, will be on CGPA of the student).

6.4 If more entries for Registration of a Subject, then the concerned Head of Department shall take necessary action, whether to offer such a Subject/Course for TWO (or multiple) SECTIONS or NOT subject to fulfilling the clause 6.2.

6.5 In case of options coming from Students of other Departments/ Branches/ Disciplines (not considering OPEN ELECTIVES), PRIORITY shall be given to the student of ELECTIVES), PRIORITY shall be given to the student of the 'Parent Department' first.

7.0 Attendance Requirements

7.1 A student shall be eligible to appear for the End Semester Examinations, if he acquires a minimum of 75% of attendance in aggregate of all the Subjects/ Courses (excluding Mandatory or Non-Credit Courses) for that Semester.

7.2 Condoning of shortage of attendance in aggregate up to 10% (65% and above, and below 75%) in each Semester may be granted by the College Academic Committee on genuine and valid grounds, based on the student's representation with supporting evidence.

7.3 A stipulated fee shall be payable towards condoning of shortage of attendance.

7.4 Shortage of Attendance below 65% in aggregate shall in NO case be condoned.

7.5 Students, whose shortage of attendance is not condoned in any Semester, are not eligible to take their End Examinations of that Semester, they get detained and their registration for that Semester shall stand cancelled. They will not be promoted to the next Semester. They may seek re-registration for all those subjects registered in that Semester in which he got detained, by seeking re-admission for that Semester as and when offered; in case if there are any Professional Electives and/ or Open Electives, the same may also be re-registered if offered, however, if those Elective are not offered in later Semesters, then alternate Electives may be chosen from the SAME set of the Elective Subjects offered under that Category subject to fulfilling the prerequisites.

8.0 Academic Requirements

The following Academic Requirements have to be satisfied, in addition to the Attendance Requirements mentioned in Clause No.**7.**

8.1 A student shall be deemed to have satisfied the Academic requirements and earned the credits allotted to each Subject/Course, if he secures not less than 35% marks (25 out of 70 marks) in the End Semester Examination, and a minimum of 40% of marks in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together; in terms of

Letter Grades, this implies securing P Grade or above in that Subjects/course.

8.2 A student shall be deemed to have satisfied the Academic Requirements and earned the Credits allotted to - Industry oriented Mini-Project/ Seminar, if he secures not less than 40% of the total marks (40 marks) to be awarded for each. The student would be treated as failed. If he (i) does not submit a report on this industry oriented Mini-Project, or does not make a presentation of the same before the Evaluation Committee as per schedule, or (ii) does not present the Seminar as required in the IV year II Semester, or (iii) secures less than 40% of marks (40 marks) in Industry oriented Mini-Project/ Seminar evaluations. He may reappear once for each of the above evaluations, when they are scheduled again; if he fails in such 'one reappearance' evaluation also, he has to reappear for the same in the next subsequent Semester, as and when it is scheduled.

8.3 A Student will not be promoted from I Year to II Year unless he fulfills the Attendance and Academic Requirements and secure 50% of Credits in I Year, from all the relevant regular and supplementary examinations, whether he takes those examinations or not.

8.4 A Student will not be promoted from II Year to III Year, unless he fulfills the Attendance and Academic Requirements and secure 60% of total Credits prescribed from first and second years in all the relevant regular and supplementary examinations, whether he takes those examinations or not.

8.5 A Student will not be promoted from III Year to IV Year, unless he fulfills the Attendance and Academics Requirements and secure 60% of total Credits prescribed from first, second and third years in all the relevant regular and supplementary examinations, whether he takes those examinations or not.

8.6 A Student shall- register for all the Subjects covering 192 Credits as specified and listed (with the relevant course/ subject Classification as mentioned) in the course Structures, put up all the Attendance and Academics requirements for 192 Credits securing a minimum of P Grade (pass Grade) or above in each Subject, and 'earn ALL 192 Credits securing SGPA ≥ 5.0 (in each Semester), and CGPA (at the end of each successive Semester) ≥ 5.0 to successfully complete the UGP.

8.7 After securing the necessary 192 Credits as specified for the successful completion of the entire **UGP,** an exemption of 8 secured credits (in terms of two of their corresponding subjects / courses) may be permitted for optional drop out from these192 Credits earned; resulting in 188 Credits for UGP performance evaluation, i.e., the performance of the student in these 188 Credits shall alone be taken into account for the calculation of 'the final CGPA (at the end of UGP,

which takes the SGPA of the IV Year II Semester; however, the student's performances in the earlier individual Semester, with the Corresponding SGPA and CGPA for which already Grade Cards are given, will not be altered. Further, optional drop out for such 8 secured Credits shall not be allowed for subjects / Courses listed as i) Laboratories / Practical, ii) Industrial Training / Mini-projects, iii) Seminar, iv) Major Project.

8.8 If a Student registers for some more 'extra Subjects' (in the parent Department or other Departments/ Branches of Engineering/ Pharmacy) other than those listed Subjects totaling to 192 Credits as specified in the Course Structure of his/her Department, the performances in those 'extra subjects' (although evaluated and graded using the same procedure as that of the required 192 Credits) will not be taken into account while calculating the SGPA and CGPA. For such 'extra Subjects' registered, % marks and Letter Grade alone will be indicated in the Grade Card, as a performance measure, subject to completion of the Attendance and Academic Requirements as stated in clause numbers 7 and 8 above.

8.9 Students who fail to earn192 Credits as per the Course Structure, and as indicated above, within 8 Academic Years from the Date of Commencement of their I Year shall forfeit their seats B.Pharm programme and their admissions shall stand cancelled.

8.10 When a Student is detained due to shortage of attendance in any Semester, he may be re-admitted into that semester, as and when offered, with the Academic regulations of the Batch into which he gets readmitted. However, no Grade Allotments or SGPA/ CGPA calculations will be done for that entire Semester in which he got detained.

8.11 If, a student is detained due to lack of Credits in any year, he may be readmitted in the next year, after fulfillment of the Academic Requirements, with the academics Regulations of the Batch into which he gets readmitted.

8.12 A student is eligible to appear in the End Semester Examination in any Subject/ Course, but absent at it or failed (thereby falling to secure P Grade or above), may reappear for that subject/course at the supplementary examination (SEE) as and when conducted. In such cases, his Internal Marks (CIE) assessed earlier for that Subject/Course will be carried over, and added to the Marks to be obtained in the SEE supplementary examination, for evaluating his performance in that Subjects.

9.0 Evaluation-Distribution and Weight age of Marks

9.1 The performance of a student in each Semester shall be evaluated (irrespective of Credits assigned) subject-wise with a maximum of 100 marks for

Theory or Practical or Seminar or Drawing/Design or Industry oriented Mini-Project or Minor Course, etc; however, the B.Pharm Project work (Major Project) will be evaluated for 200 Marks. These evaluations shall be based on 40% CIE (Continuous Internal Evaluation) and 60% SEE (semester End Examination), and a Letter grade corresponding to the % marks obtained shall be given.

9.2 For all Subjects/ Courses as mentioned above, the cumulative percentage of marks form CIE and SEE together should be 70 for award of distinction, 60 for award of first class and less than 60 is pass.

9.3 a) For Theory Subjects (inclusive of Minor Courses), during the Semester, there shall be 2 mid-term examinations for 20 marks each. Each mid-term examination consists of one objective paper for 5 marks, plus one subjective paper for 15 marks, with duration of 90 minutes. Further, there will be an allocation of 5 marks for Assignment and 5 marks for attendance in each subject. Objective paper may be set with multiple choice questions, True/False, fill-in the blanks, matching type questions, etc. subjective paper shall contain 5 questions, out of which the student has to answer 3 questions, each for 5 marks.

b) The first mid-term examination shall be conducted from the units 1, 2 and part of unit 3 of the syllabus, and the second mid-term examination shall be conducted from the units remaining part of 3, units 4 and 5 of the syllabus.

c) First Assignment should be submitted before the conduct of the first mid-term examinations, the Second Assignment should be submitted before the conduct of the second mid-term examinations. The assignments shall be as specified by the concerned subject teacher.

d) The first mid-term examination Marks and first Assignment Marks shall make one set of CIE Marks, and the second mid-term examination Marks together with second Assignment Marks shall make second set of CIE Marks and the average Marks of two sets of marks shall be taken as the Marks secured out of 25 Marks by the Student towards Continuous Internal Evaluation in that Theory Subject. The weightage of 5 marks towards attendance shall be awarded based on the final % of attendance of classes attended by the student in that subject. The proportional distribution of Marks shall be awarded to student as ≥95 % - 5 Marks; 90% - 94% - 4 Marks; 85% - 89% - 3 Marks, 80% - 84% - 2 Marks, 75% - 79% - 1and No weightage for <75%. The final Marks of the student towards Internal Evaluation shall be sum of Marks Secured in CIE and weightage of Marks awarded based on % of attendance.

9.4 For Practical Subjects, there shall be a Continuous Internal Evaluation (CIE) during the Semester for 30 internal marks, and 70 marks are assigned for Lab. /

Practical End Semester Examination (SEE). Out of the 30 marks for internals, day-to-day work in the laboratory shall be evaluated for 10 marks towards Lab report, 10 marks for conduct of experiments and results, 5 marks for viva-voce will make as one set of Marks secured in CIE of lab session. The average of 10 best set of Marks secured by student out of total Lab sessions held. Besides, 5 Marks towards the final % of attendance of lab sessions attended by the student in that Practical Subject (ref. 9.3).

9.5 For the Subjects having Design and/or Drawing, (such as Engineering Graphics, Engineering Drawing, Machine Drawing, Production Drawing Practice, and Estimation), the distribution shall be 30 marks for CIE (10 marks for day-to-day work, 15 marks for mid-term tests and 5 Marks towards weightage of attendance as explained in 9.3) and 70 marks for SEE**.** There shall be two internal tests in a semester and the average of two mid-term tests shall be considered for the award of marks for internal tests.

9.6 Open Electives: Students are required to choose Two Open Elective from the list of Open Electives given. However, Students cannot opt for an Open Elective Subject offered by their own (parent) Department, if it is already listed under any category of the Subjects offered by parent Department, if it is already listed under any category of the subjects offered by parent Department in any Semester.

9.7 a) There shall be an industry oriented Mini-project, in collaboration with an Industry of the relevant specialization, to be registered immediately after III Year II Semester examinations, and taken up during the summer vacation for about eight weeks duration.

b) The Industry oriented Mini-Project shall be submitted in a Report form and a presentation of the same shall be made before a Committee, which evaluates it for 100 marks. The Committee shall consist of Head of the Department, the supervisor of Mini-Project, and a senior faculty Member of the Department. There shall be no internal marks for Industry oriented Mini-project. The Mini-Project shall be evaluated in the IV Year I Semester.

9.8 There shall be a Seminar Presentation in IV Year II Semester. For the Seminar, the student shall collect the information on a specialized topic, prepare a Technical Report and submit to the Department at the time of Seminar Presentation. The seminar Presentation (along with the Technical Report) shall be evaluated by Two Faculty Members assigned by Head of the Department, for 100 marks. There shall be no SEE or external for Seminar.

9.9 Each Student shall start the project work during the IV Year I Semester, as per the instructions of the Project Guide/ Project supervisor assigned by the Head of Department. Out of total 200 marks allotted for the Project work, 60 marks for the SEE (End Semester Viva-Voice Examination). The project Viva – voice shall be conducted by a committee comprising of an External Examiner, Head of the Department and Project supervisor. Out of 60 marks allocated for CIE, 30 marks shall be awarded by the Projects Supervisor (based on the continuous evaluation of the students performance throughout the Project Work period), and the other 30 marks shall be awarded by a Department and Project Supervisor, based on the work carried out and the presentation made by the Student at the time o Viva-voice Examination.

9.10 For NCC/ NSS/ NSO types of Courses, and/or any other Mandatory Non-Credit Course offered in a Semester, a 'Satisfactory Participation Certificate' shall be issued to the Student from the concerned authorities, only after securing ≥ 65% attendance in such a Course. No marks or Letter Grade shall be allotted for these activities.

10.0 Grading Procedure

10.1 Marks will be awarded to indicate the performance of each student in each Theory Subject, or Lab/ Practical, or Seminar, or Project, or Mini-Project, Minor Course etc., based on the % marks obtained in CIE+SEE (Continuous Internal Evaluation + Semester End Examination, both taken together) as specified in Item 9 above, and a Corresponding Letter Grade shall be given.

10.2 As a measure of the student's performance, a 10-point Absolute Grading System using the following Letter Grades (UGC Guidelines) and Corresponding percentage of marks shall be followed…..

% of Marks Secured (Class Intervals)	Letter Grade (UGC Guidelines)	Grade Points
80% and Above (≥ 80%, ≤ 100%)	O (Out standing)	10
Below 80% but not less than 70% (≥ 70% , < 80%)	A^+ (Excellent)	9
Below 70% but not less than 60% (≥60%, ≤ 70%)	A (Very Good)	8
Below 55% but not less than 50% (≥55%, <60%)	B (Good)	7
Below 55% but not less than 50% (≥50%, <55%)	B (above Average)	6
Below 50% but not less than 45% (≥45%, <50%)	C (Average)	5
Below 45% but not less than 40%(≥40%, <45%)	P (Pass)	4
Below 40% (< 40%)	F (Fail)	0

10.3 A student obtaining F Grade in any Subject shall be considered 'failed' and will be required to reappear as 'Supplementary Candidate' in the End Semester Examination (SEE), as and when offered. In such cases, his Internal Marks (CIE Marks) in that Subject (s) will remain same as those he obtained earlier.

10.4 A Letter Grade does not imply any specific % of Marks.

10.5 In general, a student shall not be permitted to repeat any Subject/Course (s) only for the sake of 'Grade Improvement' or 'SGPA / CGPA Improvement'. However, he has to repeat all the Subjects /Courses pertaining to that Semester, when he is detained (as listed in Items 8.10-8.11).

10.6 A Student earns Grade Point (GP) in each Subject/Course, on the basis of the Letter Grade obtained by him in that subject/Course (excluding Mandatory non-credit Courses). Then the corresponding 'Credits Points' (CP) are computed by multiplying the Grade Point with Credits for that particular Subject/Course.
Credit Points (CP) =Grade Point (GP) x Credits …..For a Course

10.7 The Student passes the Subject/ Course only when he gets GP ≥ 4 (P Grade or above).

10.8 The Semester Grade Point Average (SGPA) is calculated by dividing the Sum of Credit Points (ΣCP) secured from ALL Subjects/ Courses registered in a Semester, by the Total Number of Credits registered during that Semester. SGPA is rounded off to TWO Decimal Places. SGPA is thus computed as Where 'I' is the subject indicator index (takes into account all Subjects in a semester), 'N' is the no. of Subjects 'REGISTERED' for the semester (as specifically required and listed under the course Structure of the parent Department), is the no. of Credits allotted to the ith subject, and represents the Grade Points (GP) corresponding to the Letter Grade awarded for that ith subject.

$$\text{SGPA} = \{ \sum_{i=1}^{N} C_i G_i \} / \{ \sum_{i=1}^{N} C_i \} \text{ .... For each Semester,}$$

10.9 The Cumulative Grade point Average (CGPA) is a measure of the overall cumulative performance of a student overall semesters considered for registration. The CGPA is the ratio of the Total Credit Points secured by a student in ALL. Registered Course in ALL the Semesters. CGPA is rounded off to TWO Decimal Places. CGPA is thus computed from the I Year Second semester onwards, at the end of each Semester, as per the formula where 'M' is the TOTAL no. of Subjects (as specifically required and listed under the Course Structure of the parent Department) the Student has 'REGISTERED' from the 1st Semester onwards up to and inclusive of the Semester S (obviously M>N), 'i' is

the Subject indicator index (takes into account all Subjects from 1 to S Semesters), is the no. of Credits allotted to the jth subject, and represents the Grade Points (GP) corresponding to the Letter Grade awarded for that jth Subject. After registration to the Letter Grade awarded for that jth Subject. After registration and completion of I Year I Semester however, the SGPA of that Semester itself may be taken as the CGPA, as there are no cumulative effects.

$$CGPA = \{ \sum_{j=1}^{M} C_j G_j \} / \{ \sum_{j=1}^{M} C_j \} \text{ ... for all S Semesters registered (ie., upto and inclusive of S Semesters, } S \geq 2 \text{),}$$

10.10 For Merit Ranking or Comparison Purposes or any other listing, ONLY the 'ROUNDED OFF' values of the CGPAs will be used.

10.11 For Calculations listed in Item 10.6 – 10.10, performance in failed Subjects/Courses (securing F Grade) will also be taken into account, and the Credits of such Subjects/ Courses will also be included in the multiplications and summations. However, Mandatory Courses will not be taken into consideration.

10.12 Passing Standards:

10.12.1 A student shall be declared successful or 'passed' in a Semester, only when he gets a SGPA ≥ 5.00 (at the end of that particular Semester); and a student shall be declared successful or 'passed' in the entire UGP, only when gets a CGPA ≥ 5.00; subject to the condition that he secures a GP ≥ 4 (P Grade or above) in every registered Subject/ Course in each Semester (during the entire UGP) for the Degree Award, as required.

$$CGPA = \{ \sum_{j=1}^{M} C_j G_j \} / \{ \sum_{j=1}^{M} C_j \} \text{ ... for all S Semesters registered (ie., upto and inclusive of S Semesters, } S \geq 2 \text{),}$$

10.12.2 In spite of securing P Grade or above in some (or all) Subjects/ Courses in any Semester, if a
Student receives a SGPA < 5.00 and/ or CGPA < 5.00 at the end of such a Semester, then he 'may be allowed' (on the 'specific recommendations' of the Head of the Department and subsequent approval from the Principal) –

(i) to go into the next subsequent Semester (subject to fulfilling all other attendance and academic requirements as listed under Items 7-8);
(ii) to 'improve his SGPA of such a Semester (and hence CGPA) to 5.00 or above', by reappearing for ONE or MORE (as per Student's choice) of the same Subject(s) / Course(s) in which he has

secured P Grade(s) in that Semester, at the Supplementary Examination to be held in the next subsequent semester(s). In such cases, his Internal marks (CIE Marks) in those Subject(s) will remain same as those he obtained earlier.
In these considerations, the newly secured Letter Grades will be recorded and taken into account for calculation of SGPA and CGPA, only if there is an improvement.

10.12.3 A Student shall be declared successful or 'passed' in any Non-Credit Subject/ Course, if he secures a 'Satisfactory Participation Certificate' for that Mandatory Course.

10.13 After the completion of each Semester, a Grade Card or Grade Sheet (or Transcript) shall be issued to all the Registered Students of that Semester, indicating the Letter Grades and Credits earned. It will show the details of the Courses Registered (Course Code, Title, No. of Credits, Grade Earned etc.), Credits earned, SGPA and CGPA.

11.0 Declaration of Results

11.1 Computation of SGPA and CGPA are done using the procedure listed in 10.6 – 10.10.

11.2 For Final % of marks equivalent to the computed final CGPA, the following formula may be used..

% of Marks = (final CGPA – 0.5) x 10

12.0 Award of Degree

12.1 A student who registers for all the specified Subjects/ Courses as listed in the Course Structure, satisfies all the course Requirements, and passes all the examinations prescribed in the entire UG E&T Programme (UGP), and secures the required number of 192 Credits (with CGPA ≥ 5.0), within 8 Academics years from the Date of Commencement of the First Academics Year, shall be declared to have ' QUALIFIED' for the Award of the B.Pharm Degree in the chosen Branch of Engineering as selected at the time of Admission.

12.2 A Student who qualifies for the award of the degree as listed in Item 12.1 shall be placed in the following Classes.

12.3 Students with final CGPA (at the end of the UGP) ≥ 8.00, and fulfilling the

following conditions –

(i) Should have passed all the Subjects/Courses in 'FIRST APPEARANCE' within the first 4 Academic Years (or 8 Sequential Semesters) from the Date of Commencement of his First Academic Year,

(ii) Should have secured a CGPA ≥ 8.00, at the end of each of the 8 Sequential Semesters, starting from the I Year I Semester onwards,

(ii) Should not have been detained or prevented from writing the End Semester Examinations in any Semester due to shortage of attendance or any other reason, shall be placed in 'FIRST CLASS with DISTINCTION'. Students having final CGPA (at the end of UGP) ≥ 8.00, but not fulfilling the above conditions shall be placed in 'FIRST CLASS'.

12.4 Students with final CGPA (at the end of the UGP) ≥ 6.50 but < 8.00, shall be placed in 'FIRST CLASS'

12.5 Students with final CGPA (at the end of the UGP) ≥ 5.50 but < 6.50, shall be placed in 'SECOND CLASS'

12.6 All other Students who qualify for the Award of the Degree (as per Item 12.1), with final CGPA (at the end of the UGP) ≥ 5.00 but <5.50, shall be placed in 'PASS CLASS'.

12.7 A student with final CGPA (at the end of the UGP) < 5.00 will not be eligible for the Award of the Degree.

12.8 Student fulfilling the conditions listed under Item 12.3 alone will be eligible candidates for – 'University Rank' and 'Gold Medal' considerations.

13.0 Withholding of Results

13.1 If the student has not paid fees to University / College at any stage, or has pending dues against his name due to any reason whatsoever, or if any case of indiscipline is pending against him, the result of the student may be withheld, and he will not allowed to go into the next higher Semester. The Award or issue of the Degree may also be withheld in such cases.

14.0 Transitory Regulations

14.1 Student who has discontinued for any reason, or has been detained for want of attendance or lack of required credits as specified, or who has failed after having undergone the Degree Programme, may be considered eligible for admission to the same Subjects/Courses (or equivalent Subjects/ Courses, as the case may be), and same professional Electives/Open Electives (or from set/category of Electives or equivalents suggested, as the case may be) as and when they are offered (within the time-frame of 8 years from the Date of Commencement of his I Year I Semester).

15.0 Student Transfers

15.1 There shall be no Branch transfers after the completion of Admission Process.

15.2 There shall be transfer among the Autonomous Colleges, affiliated to Jawaharlal Nehru Technical University Hyderabad subject to approval of Telangana State Government and affiliated University.

16.0 Scope

(i) Where the words “he”, “him”, ”his”, occur in the write-up of regulations, they include “she”, “her”, “hers”.

(ii) Where the words “Subject” or “Subjects”, occur in these regulations, they also imply “Course” or “Courses”.

(iii) The Academic Regulations should be read as a whole, for the purpose of any interpretation.

(iv) In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Principal / Director is final.

(v) The College may change or amend the Academic Regulations, Course Structure or Syllabus at any time, and the changes or amendments made shall be applicable to all Students with effect from the dates notified by the College Authorities.

****

MALPRACTICES RULES

	Nature of Malpractices	Punishment
	If Candidate:	
1(a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
1(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case id registered against him.
2	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidates has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examination of the subjects of that Semester/year. The hall ticket of the candidate is to be cancelled.
3	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate, who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for

		examinations of the remaining subjects of the Semester/year. The candidate is also debarred for two consecutive semesters from class work and all examinations. The continuation of the course by the candidate is subject to the academic regulation in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and case is registered against him.
4	Smuggles in the answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examination of the subjects of the semester/year . The candidate is also debarred for two consecutive semesters from class work and all examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiner or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6	Refuses to obey the orders of the chief superintendent/ Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organize a walk out or instigates others to walk out, or threatens the officer-in charge or any persons on duty in or outside the examination hall of any injury to his persons or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any persons on duty in or outside the examination hall or any of his	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats, in case of outsiders, they will be handed over to the police and a police case is registered against them.

	relations, or indulges in any other act of misconduct or mischief which results in damage to or destruction of properly in the examination hall or any part of the college campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	
7	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examination of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8	Possess any Lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examination of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.
9	If student of the college, who is not candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Persons(s) who do not belong to the college will be handed over to police and, a police case will be registered against them.

10	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work shall not be permitted for the remaining examination of the subjects of that semester/year.
11	Copying detected on the basis of internal evidence, such as, during valuation or during special security.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester / year examination.
12	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the college/ University for the further action to award suitable punishment.	

COURSE OF STUDY FOR SEMESTER-I

S. No	Course Code	Subject	L	T	P	Credits
1	#**HM0114/** *PH0111	Remedial Mathematics / Remedial Biology - I	4/2	1/0	0	4/2
2	**PH0142**	Dispensing and General Pharmacy	4	2	0	4
3	**PH0143**	Anatomy, Physiology and Health Education – I	3	2	0	3
4	**PH0144**	Pharmaceutical Organic Chemistry – I	4	2	0	4
5	**HE0133**	Professional Communication in English	3	2	0	3
6	**PH0145**	Dispensing and General Pharmacy Lab	0	0	3	2
7	**PH0146**	Anatomy, Physiology and Health Education – I Lab	0	0	3	2
8	**PH0147**	Pharmaceutical Organic Chemistry – I Lab	0	0	3	2
9	*PH0118	Remedial Biology – I Lab	0	0	3	2
10	**GN0193**	NSS	0	0	0	0
		Total	**18/16**	**09/08**	**9/12**	**24/24**

 # For Students of Bi.P.C. Stream *** For Students of M.P.C. Stream**

COURSE OF STUDY FOR SEMESTER-II

S. No	Course Code	Subject	L	T	P	Credits
1	**PH0241**	Pharmaceutical lnorganic Chemistry	3	2	0	3
2	**PH0242**	Pharmaceutical Organic Chemistry – II	4	2	0	4
3	**PH0243**	Physical Pharmacy - I	4	2	0	4
4	**HM0215**	Statistical Methods and Computer applications	3	1	0	3
5	**PH0244**	Anatomy, Physiology and Health Education – II	4	2	0	4
6	**PH0245**	Pharmaceutical lnorganic Chemistry Lab	0	0	3	2
7	**HM0216**	Statistical Methods and Computer applications Lab	0	0	3	2
8	**PH0246**	Physical Pharmacy – I Lab	0	0	3	2
9	**GN0291**	Seminar	0	0	0	0
		Total	**18**	**09**	**09**	**24**

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

I Year B. Pharm I-Sem	**L**	**P**	**C**
	4+1	**-**	**4**

REMEDIAL MATHEMATICS (HM0114)

Objectives: This is an introductory course in mathematics, the subject deals with introduction to algerbra, trigonometry, differential calculus, integral calculus etc.

UNIT I

Algebra:

Permutations & combinations - Binomial theorem –Partial fractions (addition, subtraction & multiplication) –Matrices –Determinants -Application of determinants to solve simultaneous equations (Cramer's Rule).

UNIT II

Trigonometry: measurement of angles, trigonometry functions, compoumd angles, trigonometry ratios of multiple angles (sin 2θ, cos 2θ, tan 2 θ), Heights and distances (All simple problems only).

Co-ordinate Geometry: Distances between two points, Area of a triangle, division of line segment, locus.

UNIT III

Differential Calculus: Continuity and limit: Differentiation, derivative of product, derivative of function, derivation of a fraction of functions

Derivatives of trigonometric functions (excluding inverse trigonometric and hyperbolic functions). Derivatives of Logarithmic and exponential functional, partial dedifferentiation, maxima and minima (all simple problems)

UNIT IV

Integral Calculus: integration of algebraic and exponential functions, Integration of trignometric functions, integration by parts, integration by the method of substitution, definite integrals, areas and curves (all simple problems)

UNIT V

Differential equations: Formation of a differential equation, equation of 1^{st} order and 1^{st} degree, Homogenous, exact differential equation

Outcome: The student will learn the basics of mathematics which will be helpful in pharmaceutical calculation in the higher classes

TEXT BOOKS

1. Intermediate first Year mathematics and Intermediate Second year mathematics., printed and published by Telugu Academy,Himayath nagar, Hyderabad
2. Remedial Mathmatics by Shahnaz Bathul
3. Text book of Pharmaceutical Mathematics with Application to Pharmacy- Panchaksharappa Gowda.D.H.

REFERENCES

1. Pharmaceutical Arithmetic's by Mohd. Ali CBS publishers and distributor, New Delhi.
2. Higher Engineering Mathematics by Grewal.

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

I Year B. Pharm I-Sem	**L**		**P**
	4+2	**-**	**4**

DISPENSING & GENERAL PHARMACY (PH0142)

Objectives: The student shall be given orientations to know the origin of pharmacopoeias on dispensing procedure of medicines, pharmaceutical calculation, and interpretations of incompatibilities.

UNIT I

a. Genesis and Evolution of Pharmacy: History of Pharmacy, origin and development of the Pharmacopoeias, History of Ayurveda, salient features of IP, USP and BP.
Pharmacy Education – D. Pharm, B Pharm, M.Pharm, Pharma-D, Qualification for getting license.

b. Dispensing Pharmacy: Principles of dispensing, form of prescription, handling of prescription, source of errors in prescription, care required in dispensing procedures including labelling of dispensed products.

UNIT II

Calculations:
Weights and Measures, introduction to Latin terms, Percentage calculations, alligation method, proof spirit calculations, displacement value and calculations of isotonicity adjustment. General dispensing procedure- Posology-calculations of doses.

UNIT III

Principles involved and procedures adopted in dispensing of the following classes of preparations.
(i) Mixtures (ii) Solutions (iii) Emulsions (iv) Powders
(v) Lotions & liniments (vi) Ointments (vii) Suspensions (viii) Syrups
(ix) Suppositories.
Definition of the following preparations like creams, capsules, pastes, jellies, suppositories, ophthalmics, lozenges, pills, inhalations, paints, sprays and tablet triturates .

UNIT IV

P**harmaceutical ethics**
Introduction to Pharmaceutical ethics, ethical guidelines for retail pharmacist / community Pharmacist, manufacturing Pharmacist and pharmaceutical researcher

UNIT V

a) **Fundamental operations**: Weighing, measurement of liquids, procedure of dispensing solution.

b) **Colors:** Reasons for coloring pharmaceutical preparations, coloring of tablets, capsules and non-injectable fluids, Desirable properties of coloring agent, different types of coloring agents.
c) **Excipients:** Types of flavouring agents, preservatives & stabilisers

Outcome: Student will be familiar with the Hospital pharmacy organization, drug distribution procedures, dispensing, storage, incompatibilities and patient related factors.

TEXT BOOKS

1. Cooper & Gunns Dispensing Pharmacy, CBS, Publ. and Distributors New Delhi.
2. R.M Metha, Dispensing Pharmacy.
3. JS Quadry, Hospital Pharmacy.

REFERENCES

1. Lippincott Williams and Wilkins, Remington Pharmaceutical Sciences.
2. William Hassan, Hospital Pharmacy.

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

I Year B. Pharm I-Sem	**L**	**P**	**C**
	3+2	**-**	**3**

ANATOMY PHYSIOLOGY AND HEALTH EDUCATION-I (PH0143)

Objectives: This course is designed to impart a fundamental knowledge on the structure and functions of the human body .The overall anatomy and physiology of organ systems and their coordination are being dealt.

UNIT I

Scope of Anatomy and Physiology and basic terminology used in these subjects. Structure of cell, its components and their function. Elementary tissues of the human body: epithelial, connective, muscular and nervous tissues, their sub- types and characteristics. Body fluids, Homeostasis

Skeletal system: Structure, composition and functions of skeleton, classification of joints, types of movements at joints,

Skeletal muscles: Gross anatomy, physiology of muscle contraction, physiological properties of skeletal muscles and their disorders. Rhematiod arthritis, gout

UNIT II

Haemopoietic system and Lymphatic System: Composition and functions of blood and its elements, their disorders, blood groups and their significance, mechanism of coagulation, Anemias and its types,lymph organs.

UNIT III

Cardiovascular system: Basic anatomy, physiology and conduction system of heart, blood vessels and circulation. Basic pulmonary, coronary, hepatic, system, understanding of cardiac cycle, heart sounds and electrocardiogram. blood pressure and its regulation. Brief outline of cardiovascular disorders like hypertension, myocardial infarction, congestive heart failure and cardiac arrhythmias.

UNIT IV

Digestive System: Gross anatomy of the gastro-intestinal tract, functions of its different parts, various gastrointestinal secretions and their role in the absorption and digestion of food, peptis ulcer, ulcerative colitis, hepatic disorder.

UNIT V

Demography and Family Planning: population problem, family planning and various contraceptive methods. Medical termination of pregnancy.

Brief outline of communicable diseases, causative agents, modes of transmission and prevention (chicken pox, influenza, diptheria , whooping cough, tuberculosis, poliomyelitis, hepatitis, cholera, typhoid, malaria, rabies, tetanus, leprosy, syphilis and Aids).

Outcome: Describes the structure and functions of various organs of the human body and mechanisms in the maintenance of normal functioning and disease state are knows.

TEXT BOOKS

1. Tortora, G.J and Anagnodokas, Principles of Anatomy and Physiology, N.P Harper & Row Publishers N.Y
2. Ross & Willson, Text Book of Human Anatomy, M.J.Mycek S.B Gerther and MMPER
3. Human Antomy and Physiology with health education by Padma B Sanghani

REFERENCES

1. Guyton, Textbook of Medical Physiology, AC Guyton WB Sannders Company, 1995.
2. K. Sembulingam and Prema Sembulingam, Essentials of Medical Physiology, 3rd Edition, Jaypee Bros., New Delhi.

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

I Year B. Pharm I-Sem	**L**	**P**	**C**
	4+2	**-**	**4**

PHARMACEUTICAL ORGANIC CHEMISTRY-I (PH0144)

Objectives: The organic compounds are classified based on their functional groups and character. The basic principles and mechanisms of different types of organic reactions are explained in an elaborative manner.

UNIT I

a. Structure and Activity of Organic Molecules: Shapes of organic molecules, bond lengths, bond angles and bond dissociation energies. Electronic effects in organic molecules: inductive effect, electromeric or mesomeric effect, hyperconjugation, concept of resonance; types of organic reagents and reactions.

b. Aliphatic/Alicyclic Hydrocarbons: Nomenclature, isomerism (chain, conformational and geometrical) relative stabilities (heats of combustion and hydrogenation), ring stabilities of cyclohexane, chair-boat conformation, Bayer's strain theory and sachse-mohr theory. Free radical substitution reactions (halogenation) of alkanes.

UNIT II

a. Alkenes: Electrophilic addition reactions of alkenes, Markovnikov's rule, Kharasch effect, Bayer's oxidation (cis-hydroxylation, polymerisation).

b.Alkadienes: Stability & 1,4 addition reactions of conjugated alkadienes.

c. Alkynes: Acidity of 1-alkynes, formation of metal acetylides.Stereo specific reduction of alkynes.Addition of hydrogen halide (HCl) addition of water and keto-enol tautomerism.

UNIT III

Aromatic Hydrocarbons: Kekule's structure of benzene, bond lengths, heats of hydrogenation and stability, molecular orbital picture of benzene, aromaticity, Huckel's rule, nomenclature of benzene derivatives, characteristic reactions of benzene, theory of reactivity and orientation in monosubstituted benzenes.

UNIT IV

a. Halogen Compounds-Aromatic: Nomenclature, low reactivity of halo benzenes towards nucleophilic substitution, arenes.

b. Halogen Compounds-Aliphatic: Nomenclature, general methods of preparation, characteristic nucleophilic substitution reactions, factors that play role in SN^1 and SN^2, Walden inversion, elimination reaction and Saytzeff's rule.

UNIT V

Alcohols: Nomenclature, classification, general methods of preparation, physical properties, hydrogen bonding, characteristic nucleophilic substitution reactions

(replacement of -OH by -Cl), elimination reactions, and relative reactivities of 1^o, 2^o and 3^o alcohols, Meerwein Pondorff Verley reduction.

Outcome: The detailed study on the mechanisms involved in various reactions would help the students to understand the synthesis of higher organic compounds which would be dealt in future classes.

TEXT BOOKS

1. T.R.Morrison and R.N.Boyd, Organic chemistry, pentice hall of India private Limited, New Delhi.
2. I.L. Finar Vol.I. & Vol. II., The Fundamentals Principles of Organic Chemistry, ELBS/Longman.
3. Ball & Ball, Advanced pharmaceutical organic chemistry.

REFERENCES

1. Jerry March, Reactions and Mechanism 4^{th} ed.
2. Jerry March, Advanced Organic Chemistry

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

I Year B. Pharm I-Sem	**L**	**P**	**C**
	3+2	**-**	**3**

ENGLISH (HE0133)

Introduction:

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competencies of Engineering students. The prescribed books and the exercises are meant to serve broadly as students' handbooks.

In the English classes, the focus should be on the skills of reading, writing, listening and speaking and for this the teachers should use the text prescribed for detailed study. For example, the students should be encouraged to read the texts/selected paragraphs silently. The teachers can ask comprehension questions to stimulate discussion and based on the discussions students can be made to write short paragraphs/essays etc.

The text for non-detailed study is for extensive reading/reading for pleasure. Hence, it is suggested that they read it on their own the topics selected for discussion in the class. The time should be utilized for working out the exercises given after each section, as also for supplementing the exercises with authentic materials of a similar kind for example, from newspaper articles, advertisements, promotional material etc.. *However, the stress in this syllabus is on skill development, fostering ideas and practice of language skills.*

Objectives:

a. To improve the language proficiency of the students in English with emphasis on LSRW skills.
b. To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.
c. To develop the study skills and communication skills in formal and informal situations.

SYLLABUS:

Listening Skills:

Objectives

1. To enable students to develop their listening skill so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation
2. To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and regions

Students should be given practice in listening to the sounds of the language to be able to recognise them, to distinguish between them to mark stress and recognise and use the right intonation in sentences.

- Listening for general content
- Listening to fill up information
- Intensive listening

• Listening for specific information

Speaking Skills:

Objectives

1. To make students aware of the role of speaking in English and its contribution to their success.
2. To enable students to express themselves fluently and appropriately in social and professional contexts.

• Oral practice
• Describing objects/situations/people
• Role play – Individual/Group activities (Using exercises from the five units of the prescribed text: ***Skills Annexe -Functional English for Success)***
• Just A Minute(JAM) Sessions.

Reading Skills:

Objectives

1. To develop an awareness in the students about the significance of silent reading and comprehension.
2. To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.

• Skimming the text
• Understanding the gist of an argument
• Identifying the topic sentence
• Inferring lexical and contextual meaning
• Understanding discourse features
• Scanning
• Recognizing coherence/sequencing of sentences

NOTE : *The students will be trained in reading skills using the prescribed text for detailed study.*

They will be examined in reading and answering questions using 'unseen' passages which may be taken from authentic texts, such as magazines/newspaper articles.

Writing Skills :

Objectives

1. To develop an awareness in the students about writing as an exact and formal skill
2. To equip them with the components of different forms of writing, beginning with the lower order ones.

• Writing sentences
• Use of appropriate vocabulary
• Paragraph writing
• Coherence and cohesiveness
• Narration / description
• Note Making
• Formal and informal letter writing
• Describing graphs using expressions of comparison

TEXTBOOKS PRESCRIBED:

In order to improve the proficiency of the student in the acquisition of the four skills mentioned above, the following texts and course content, divided into **Five Units**, are prescribed:

For Detailed study: **First Textbook:** ***"Skills Annexe -Functional English for Success***", Published by Orient Black Swan, Hyderabad

For Non-detailed study

1. **Second text book** ***"Epitome of Wisdom",*** Published by Maruthi Publications, Guntur
2. The course content and study material is divided into **Five Units.**

Unit –I:

1. Chapter entitled '***Wit and Humour***' from '**Skills Annexe' -Functional English for Success**, Published by Orient Black Swan, Hyderabad
2. Chapter entitled **'*Mokshagundam Visvesvaraya'*** from ***"Epitome of Wisdom",*** Published by Maruthi Publications, Hyderabad.

L-Listening For Sounds, Stress and Intonation
S-Greeting and Taking Leave, Introducing Oneself and Others (Formal and Informal Situations)
R- Reading for Subject/ Theme
W- Writing Paragraphs
G-Types of Nouns and Pronouns
V- Homonyms, homophones synonyms, antonyms

Unit –II

1. Chapter entitled "***Cyber Age"*** from "***Skills Annexe -Functional English for Success***" Published by Orient Black Swan, Hyderabad.

2. Chapter entitled **'*Three Days To See'*** from ***"Epitome of Wisdom",*** Published by Maruthi Publications, Hyderabad.

L – Listening for themes and facts
S – Apologizing, interrupting, requesting and making polite conversation
R- for theme and gist
W- Describing people, places, objects, events
G- Verb forms
V- noun, verb, adjective and adverb

Unit –III

1. Chapter entitled **'*Risk Management'*** from **"*Skills Annexe -Functional English for Success*"** Published by Orient Black Swan, Hyderabad
2. Chapter entitled ***'Leela's Friend'*** by R.K. Narayan from ***"Epitome of Wisdom",*** Published by Maruthi Publications, Hyderabad

L – for main points and sub-points for note taking

S – giving instructions and directions; Speaking of hypothetical situations
R – reading for details
W – note-making, information transfer, punctuation
G – present tense
V – synonyms and antonyms

Unit –IV

1. Chapter entitled '***Human Values and Professional Ethics'*** from "***Skills Annexe - Functional English for Success"*** Published by Orient Black Swan, Hyderabad
2. Chapter entitled ***'The Last Leaf'*** from ***"Epitome of Wisdom"***, Published by Maruthi Publications, Hyderabad

L -Listening for specific details and information
S- narrating, expressing opinions and telephone interactions
R -Reading for specific details and information
W- Writing formal letters and CVs
G- Past and future tenses
V- Vocabulary - idioms and Phrasal verbs

Unit –V

1. Chapter entitled '***Sports and Health'*** from ***"Skills Annexe -Functional English for Success***" Published by Orient Black Swan, Hyderabad
2. Chapter entitled ***'The Convocation Speech'*** by N.R. Narayanmurthy' from ***"Epitome of Wisdom"***, Published by Maruthi Publications, Hyderabad

L- Critical Listening and Listening for speaker's tone/ attitude
S- Group discussion and Making presentations
R- Critical reading, reading for reference
W-Project proposals; Technical reports, Project Reports and Research Papers
G- Adjectives, prepositions and concord
V- Collocations and Technical vocabulary
Using words appropriately
* Exercises from the texts not prescribed shall also be used for classroom tasks.

Outcomes:

1. Usage of English Language, written and spoken.
2. Enrichment of comprehension and fluency
3. Gaining confidence in using language in verbal situations.

TEXT BOOKS

1. Contemporary English Grammar Structures and Composition by David Green, MacMillan Publishers, New Delhi. 2010.
2. Innovate with English: A Course in English for Engineering Students, edited by T Samson, Foundation Books.
3. English Grammar Practice, Raj N Bakshi, Orient Longman.

REFERENCES

1. Technical Communication by Daniel Riordan. 2011. Cengage Publications. New Delhi.
2. Effective English, edited by E Suresh Kumar, A RamaKrishna Rao**,** P Sreehari, Published by Pearson

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

B. Pharm, I Year I semester	**L**	**P**	**C**
	2+0	**-**	**2**

REMEDIAL BIOLOGY (PH0111)

Objectives: This is an introductory course in biology which gives detailed study on natural sources such as plant and animal origin. This subject deals with the plant cell, animal cell classifications plant kingdom and study of animal issues and study about frogs and some animals.

UNIT I

Plant cell and tissues: ultra structure of plant cell and its inclusions. Cell division-mitosis and meiosis. Types of tissues and their functions, tissue systems.

UNIT II

Morphology and histology of root, stem, bark, wood, leaf, flower, fruit and seed. Modifications of root and stem.

UNIT III

Taxonomy: Systemic position and classification of following families: umbelliferae, apocyanaceae and liliaceae.

UNIT IV

Animal cells and tissues: ultrastructure of animal cell, cell division, types of cells and tissues and their functions

Study of anatomy of frog; Basic study of digestive system, CVS, nervous system, genito-urinary system, musculoskeletal system.

UNIT V

Structure and life history of parasites illustrated by Amoeba, Entamoeba, Trypanosome, Plasmodium, Taenia, Ascaris,

Outcome: The student will learn details about plant and animal cells plant taxonomy classification and some aspects of physiology of frogs and animals.

SUGGESTED TEXT BOOKS

1. Intermediate First Year and Second Year Botany / Zoology Text Books printed and published by Telugu Academy, Himayatnagar and Hyderabad.
2. A.C. Dutta, Text Book of Botany
3. Botany for Degree students Vol I & II by B.P. Pandey
4. Enger- Concepts biology

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

I Year B. Pharm I-Sem	**L**	**P**	**C**
	-	**3**	**2**

DISPENSING & GENERAL PHARMACY LAB (PH0145)

1. Dispensing of prescriptions falling under the categories; Mixtures, solutions, emulsions, creams, ointments, powders, pastes, lotions, liniments, inhalations, paints, syrups, Suppositories etc.
2. Dispensing procedures involving pharmaceutical calculations, pricing of prescriptions and dosage calculations for paediatric and geriatric patients.
3. Dispensing of prescriptions involving adjustment of tonicity.
4. Categorization and storage of pharmaceutical products based on legal requirements of labelling and storage.
5. Project report on visit to the community pharmacy for Counseling on the rational use of drugs and aspects of health care.

REFERENCES:

1. Pharmaceutics –I, Practical manual by N.K.Jain, Vijay Mishra
2. Dispensing pharmacy practical manual by B.S.Sanmethi, K.Mehta and Anshu Gupta

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

I Year B. Pharm I-Sem	**L**	**P**	**C**
	-	**3**	**2**

ANATOMY, PHYSIOLOGY & HEALTH EDUCATION-I LAB (PH0146)
(21 Experiments)

1. Study of human skeleton
2. Study of different systems with the help of charts and models
3. Microscopic study of different tissues
4. Estimation of Haemoglobin in blood, Determination of bleeding time, clotting time – 3 Experiments.
5. Estimation of R.B.C. count – 2 Experiments.
6. Estimation of W.B.C count – 2 Experiments.
7. Estimation of D.L.C.
8. Recording of body temperature, pulse rate and blood pressure, basic understanding of electrocardiogram-PQRST waves and their significance
9. Determination of vital capacity, experiments on spirometry
10. Study of reproductive system with the help of charts and models
11. Various devices used in Famliy planning like Copper T, Lippers loop, Pills, Diapharagm and Condom.
12. Microscopic studies of abnormal tissue sections
13. Simple experiments involved in the analysis of normal and abnormal urine; collection of specimen, appearance, determination of pH, sugars, proteins, urea and creatinine
14. Study of special senses with the help of charts and models

REFERENCES

1. Plummer, Practical Biochemistry
2. Chatterjee, Human Physiology
3. C.L. Ghai, Pratical Physiology
4. Elaine N. Marieb, Human Anatomy & Physiology.

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

I Year B. Pharm I-Sem	**L**	**P**	**C**
	-	**3**	**2**

PHARMACEUTICAL ORGANIC CHEMISTRY-I LAB (PH0147)

I. Introduction to Equipment & Glassware

1. Determination of melting point/boiling point by Thiels method.
2. Determination of Mixed melting point for organic compounds.
3. Recrystallization (Purification including decolourization) of two organic compounds.
4. Purification and drying of organic solvents.

II. Preparation of organic compounds (each involving a specific organic reaction covered in theory)

1. N-Acetylation : Preparation of Acetanilide from Aniline
2. O-Acetylation : Preparation of Aspirin from Salicylic acid
3. Nuclear Bromination: Preparation of p-Bromoacetanilide from Acetanilide
4. Hydrolysis: Preparation of p-Bromoaniline from p- Bromoacetanilide
5. Nuclear Nitration: Preparation of m-Dinitrobenzene from nitrobenzene
6. Oxidation : Preparation of Benzoic acid from Benzyl chloride
7. Esterification : Preparation of n-Butylacetate from n-Butylalcohol
8. Etherification : Preparation of β-Naphthyl methyl ether from β-Naphthol
9. α-Halogenation: Preparation of Iodoform from Oxidation of Acetone
10. Extensive Nuclear Substitution: Preparation of Tribromophenol or BrominationTribromoaniline from Phenol or Aniline

III. Systematic qualitative Analysis (Identification) of Monofunctional Organic Compounds:

Avoid water-soluble compounds, and compounds containing more than one functional group; at least six individual compounds to be analyzed.

REFERENCES

1. Vogel's Text Book of Practical Organic Chemistry, 5th Edition.
2. R.K. Bansal, Laboratory Manual of Organic Chemistry.
3. O.P. Agarwal, Advanced Practical Organic Chemistry.
4. F.G.Mann & B.C. Saunders, Practical Organic Chemistry.
5. Organic Chemistry a lab manual, Cengage learning India Pvt. Ltd. By Pavia
6. Advanced Practical Organic Chemistry, Vishoi-Vikas Publications.

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

I Year B. Pharm I-Sem	**L**	**P**	**C**
	-	**3**	**2**

REMEDIAL BIOLOGY LAB (PH0118)

a. Introduction to simple and compound microscope and their handling
b. Morphological study of various plant parts
c. Study of histology of monocot root, stem, leaf and dicot root, stem and leaf
d. Systemic study of representatives of following families: apocyanaceae, solanaceae, three sub families of leguminaceae and liliaceae
e. Demonstration of various systems of frog
f. Study of structure of human parasites and insects mentioned in theory with the help of specimen.
g. Microscopic examination of specimens slides related to plant and animal tissues

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

I Year B. Pharm II-Sem	**L**	**P**	**C**
	3+2	**-**	**3**

PHARMACEUTICAL INORGANIC CHEMISTRY (PH0241)

Objectives: The subject has been designed to make the students understand different categories of inorganic drugs/ compounds which are used as medicinal agents

UNIT I

1. Classification of Inorganic Pharmaceuticals based on their applications and therapeutic uses.
2. Sources of impurities in pharmaceutical substances.
3. Test for purity
   (a) Setting property of plaster of paris
   (b) Ammonium compounds in sodium bicarbonate
   (c) Oxalate in sodium citrate.
   (d) Barium and thiocynate in Ammonium chloride and
4. Qualitative tests for anion and cations
5. Limit tests for arsenic, heavy metals, lead, iron, chloride and sulphate.

Note: Definition, Preparation, Assay principle, Limit tests and Uses of the compounds mentioned in Unit II to Unit V

UNIT II

1. **Electrolytes**:
   a) **Sodium and potassium replenishers**: Sodium chloride, compound sodium chloride solution (Ringer solution), potassium chloride, ORS.
   b) **Calcium replenishers**: Calcium gluconate, dibasic calcium phosphate, calcium chloride.

2. Acid base regulators: Sodium bicarbonate, sodium lactate, sodium citrate/potassium citrate, sodium acetate, and ammonium chloride

3. Dialysis fluids: Haemodialysis fluids.

UNIT III

Gastro-intestinal agents.

1. **Acidifiers and Antacids:** Dilute hydrochloric acid, sodium acid phosphate, sodium bicarbonate, aluminium hydroxide gel, dried aluminium hydroxide gel, magnesium oxide (Magnesia), magnesium hydroxide mixture, magnesium trisilicate.
2. **Adsorbents and related drugs**: Light kaolin, heavy kaolin, and activated charcoal.
3. **Laxatives:** Magnesium sulphate, sodium phosphate.
4. **Mineral Nutrients / Supplements**

a) **Haematinics** – Ferrous sulphate, ferrous fumarate, ferrous gluconate, ferric ammonium citrate, iron and dextrose injection.
b) **Halogens:** Iodine, Iodides.

5. **Pharmaceutical aids:**
   a) **Excipients**: Dicalcium phosphate, magnesium stearate, talc and calcium carbonate (Precipitated chalk).
   b) **Suspending agents**: Bentonite, colloidal silica.
   c) **Colorants:** Titanium oxide, Ferric oxide

UNIT-IV

a) **Expectorants**: Ammonium chloride, potassium iodide.
b) **Emetics**: Potassium antimony tartarate, copper sulphate.
c) **Antidotes:** Sodium thiosulphate, sodium nitrite.

Topical agents:

1. **Astringents:** Zinc sulphate, calcium hydroxide, Bismuth sub carbonate.
2. **Topical protectants:** Zinc oxide, calamine, zinc stearate, talc, titanium-dioxide, heavy kaolin and light kaolin (only uses).
3. **Silicone polymers:** Activated dimethicone.
4. **Anti-Infectives:** Hydrogen peroxide solution, potassium permanganate, silver nitrate (silver protein), iodine, (solutions of iodine, povidone iodine), boric acid, zinc undecylenate, mercury compounds (yellow mercuric chloride)

UNIT-V

Dental products:

1. **Fluorides**: Sodium fluoride, sodium monofluorophosphate and stannous fluoride.
2. **Oral antiseptics and Astringents**: Hydrogen peroxide, magnesium, peroxide, zinc peroxide and mouth washes.
3. **Dentifrices**: Calcium carbonate, dibasic calcium phosphate, calcium phosphate, sodium metaphosphate and strontium chloride.
4. **Cements & fillers** : Zinc oxide (only uses).

Miscellaneous Medicinal Agents

a) Antineoplastics : Cisplatin
b) Antidepressants : Lithium carbonate
c) Diagnostic agents : Barium sulphate
d) Surgical Aids : Plaster of Paris
e) Antirheumatic agents : Sodium aurothiomalate
f) Internal parasiticid : Sodium antimony gluconate
g) Anti thyroid agents : Potassium perchlorate

Outcome: The knowledge gained by the student after studying the subject in detailed manner will be applicable to study and understand the concept for higher classes.

TEXT BOOKS

1. A.H.Beckett and J.B.Stenlake, Practical pharmaceutical chemistry, Part-I. The Athtone press, University of London, London.
2. P. Gundu Rao, Inorganic pharmaceutical chemistry; Vallabh Prakashan, Delhi.
3. Advanced Inorganic Chemistry by Satya prakash, G.D.Tuli

REFERENCES

1. L.M. Atherden, Bentley and Driver's Textbook of Pharmaceutical Chemistry Oxford University Press, London.
2. Indian Pharmacopoeia 1996, 2006.

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

I Year B. Pharm II-Sem	**L**	**P**	**C**
	4+2	**-**	**4**

PHARMACEUTICAL ORGANIC CHEMISTRY - II (PH0242)

Objectives: The organic compounds are classified based on their functional groups and character. The basic principles and mechanisms of different types of organic reactions are explained in an elaborative manner.

UNIT I

a. Carbonyl Compounds: Nomenclature, two important methods of preparation, polarity of carbonyl group, relative reactivities of carbonyl compounds, nucleophilic addition and addition-elimination reactions, oxidation-reduction reactions, aldol condensation, Cannizzaro reaction, benzoin condensation, Perkins reactions, Reformatsky reaction, Oppenauer oxidation.

UNIT II

a. Ethers: Nomenclature, Williamson's synthesis, action of hydro iodic acid on ethers (Ziesel's method).

b. Phenols: Nomenclature, general methods of preparation, physical properties, acidity of phenols, stability of phenoxide ion, reactions of phenols, Kolbe-schmidt reaction stability of conjugated dienes, and Fries rearrangement, Reamer-Tiemann Reaction.

UNIT III

a. Carboxylic acids and their derivatives:

Carboxylic acids: Nomenclature, intermolecular association, stability of carboxylate anion, two important methods of preparation, decarboxylation, functional groups reactions, reduction of carboxylic acids. a note on dicarboxylic acids.

Acid derivatives: (acid chlorides, anhydrides, esters and amides). Nomenclature, reactions like hydrolysis, reduction of esters and amides, Hofmann's degradation of amides.Brief account of preparation and properties of malonic and acetoacetic esters, their importance in organic syntheses.

UNIT I V

a. Nitro compounds: Nomenclature, acidity of nitro compounds containing α- hydrogens, reductive reactions of aromatic nitro compounds.

b. Nitriles and isonitriles: Nomenclature, two methods of synthesis, reactivity and functional reactions.

UNIT V

a. Amines: Nomenclature, basicity of amines, classification, relative reactivity, hinsberg method of separation, acylation reactions.Diazotisation and reactions of diazonium salts.
b. Organo metallic compounds: Synthetic applications of Grignard reagent

Outcome: The detailed study on the mechanisms involved in various reactions would help the students to understand the synthesis of higher organic compounds which would be dealt in future classes.

TEXT BOOKS

1. T.R.Morrison and R.N.Boyd, Organic chemistry, pentice hall of India private Limited, New Delhi.
2. I.L. Finar Vol.I. & Vol. II., the Fundamentals Principles of Organic Chemistry, ELBS/Longman.
3. Ball & Ball, Advanced pharmaceutical organic chemistry.

REFERENCES

1. Jerry March, Advanced Organic Chemistry
2. Bruce, Organic chemistry

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

I Year B. Pharm II-Sem	**L**	**P**	**C**
	4+2	**-**	**4**

PHYSICAL PHARMACY – I (PH0243)

Objectives: The student shall know important physical properties of drug molecules, phase value & its importance. Different law of thermodynamics, electrolyte and non-electrolyte solutions, importance of p^H and drug research.

UNIT I

Physical properties of Drug Molecules: Dielectric constant induced polarization, dipole moment, refractive index and molar refraction and optical rotatory dispersion.

UNIT II

a. Phase equilibria and the phase rule:- System containing single component, System containing two component, two component system containing solid and liquid phases, three component systems

b. Thermodynamics: The first law of thermodynamics. The second law of thermodynamics. The third law of thermodynamics, Free energy functions and applications.

UNIT III

a. Solutions of Electrolytes: Properties of solutions of electrolytes. The Arrhenius theory of electrolyte dissociation. The modern theory of strong electrolytes and other coefficients for expressing colligative properties.

b. Solutions of Non electrolytes: Concentration expressions, ideal and real solutions, colligative properties, molecular weight determinations.

UNIT IV

Ionic equilibria: Modern theories of acids, bases and salts, Sorensen's pH scale, species concentration as a function of pH, calculation of pH and acidity constants.

UNIT V

Buffers and buffered isotonic systems: The buffer equation, buffer capacity, buffers in pharmaceutical and biological systems, buffered isotonic solutions, methods of adjusting tonicity and pH (relevant numerical problems).

Outcome: Student will know about physical properties of molecules, three laws of thermodynamics, properties of electrolytes and non electrolytes, p^H and buffers. They also understand the importance of these studies in the physical pharmaceutics & Formulation development.

TEXT BOOKS

1. Patrick J. Sinko, Martin's Physical Pharmacy and Pharmaceutical Sciences Fifth Edition.
2. C.V.S.Subramanyam, Essentials of Physical Pharmacy, Vallabh Prakashan.
3. Lippincott Williams and Wilkins, Remington Pharmaceutical Sciences.

REFERENCES

1. Pharmacopoeias, (I.P., B.P., U.S.P. and European.)
2. Martindale, The Extra Pharmacopoeia; latest edition, the Royal Pharmaceutical Society.

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

I Year B. Pharm II-Sem	**L**	**P**	**C**
	3+1	**-**	**3**

STATISTICAL METHODS AND COMPUTER APPLICATIONS (HM0215)

Section - A: Bio-statistics

Objectives: The objective of the course, centered around various techniques, collection of data and its treatment; Probability and distribution, correlation, regression and statistical inferences, besides computer application.

UNIT I

i. **Data collection and treatment:** Data Colection and organization, diagrammatic representation of data(bar, pie, 2-D and 3-D diagrams), standard deviation and standard error of means, co-efficient of variation, Correlation and regression analysis.
ii. **Probability and Distributions:** Bayer's theorem, probability theorem, elements of binomial and poison distribution, normal distribution curve and properties**.**

UNIT II

Statistical inference: Common parametric and non-parametric tests (t-test, F-test, X^2-test employed in testing of significance in biological/pharmaceutical experiments and elements of ANOVA (One way and two way).

UNIT III

Design of experiments: Basic concepts of CRD, RBD and Latin square designs.
Sampling and Quality Control: Concept of random sampling, statistical QC charts. Applications of statistical concepts in pharmaceutical sciences.

Section - B: Computer Applications

UNIT IV

MS-Excel: Basics, spreadsheets, data types, formulas, formatting, charts, graphs. Calculation of statistical parameters using excel.
MS-Power Point: Power point Basics, views, slide controls, applied design, page setup, templates, back ground control, colour screens, transitions, and animations, working with texts, and working with graphics.

UNIT V

Database Management: Concepts and Objectives of database management systems, advantages of the database management systems and examples of DBMS packes (like DBASE III)

Introduction to structured Query language (SQL): over view of SQL, Reserved words, SQL Commands.
Computer Applications in pharmaceutical and clinical studies,

Outcome: At the end of the course the expected outcomes are thorough knowledge of statistical techniques and application of computer in pharmacy

TEXT BOOKS

1. Sanford Boltan, Pharmaceutical statistics, Practical and clinical applications
2. Pranab Kumar Benarjee, Introduction to Biostatistics
3. Khan and Khanum, Fundamentals of Biostatistics

REFERENCE

1. Roger E. Kirk, Statistics an introduction, Thomson Wadsworth
2. Walter T. Ambrosius, Topics in Biostatistics, Humana Press

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

I Year B. Pharm II-Sem	**L**	**P**	**C**
	4+2	**-**	**4**

ANATOMY, PHYSIOLOGY AND HEALTH EDUCATION-II (PH0244)

Objectives: This course is designed to impart a fundamental knowledge on the structure and functions of the human body. Since a medicament, which is produced by pharmacist, is used to correct the deviations in human body, it enhances the understanding of how the drugs act on the various body systems in correcting the disease state of the organs

UNIT I

Central Nervous System: Functions of different parts of brain and spinal cord, reflex action, electroencephalogram, cranial nerves and their functions. epilepsy, psychosis, depression, mania, Parkinsonism, Alzheimer's disease.

Autonomic Nervous System: Physiology and functions of autonomic nervous system.Mechanism of neurohumoral transmission in the A.N.S.

UNIT II

Respiratory System: Anatomy of respiratory organs. Functions of respiration, mechanism and regulation of respiration, respiratory volumes and vital capacity. Asthma, tuberculosis.

Urinary System: Various parts, structures and functions of the kidney and urinary tract. Physiology of urine formation and acid base balance, acute and chronic renal failure.

UNIT III

Endocrine System: Basic anatomy and physiology of pituitary, thyroid, parathyroid, adrenals, pancreas their hormones and functions. Diabetes, Hyperthyroidism, and Hypothyroidism.

UNIT IV

Reproductive Systems: Male and Female reproductive systems and their hormones, physiology of menstruation, Sex differentiation, Pregnancy its maintenance and parturition.

UNIT V

Basic Principles of Cell Injury, Adaptation & process of inflammation: Causes of cellular injury, pathogenesis, morphology of cell injury.Cellular adaptations, atrophy, hypertrophy.Acute and chronic inflammation, mediators of inflammation.

Outcome: Knowledge on structure and functions of various organs of the human body and the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body and the pathological states

TEXT BOOKS

1. Tortora, G.J and Anagnodokas, Principles of Anatomy and Physiology, N.P Harper & Row Publishers N.Y
2. Ross & Willson, Text Book of Human Anatomy, M.J.Mycek S.B Gerther and MMPER
3. Robbins, SL & Kumar, Basic Pathology.

REFERENCES

1. Guyton, Textbook of Medical Physiology, AC Guyton WB Sannders Company, 1995.
2. K. Sembulingam and Prema Sembulingam, Essentials of Medical Physiology, 3rd Edition, Jaypee Bros., New Delhi.

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

I Year B. Pharm II-Sem	**L**	**P**	**C**
	-	**3**	**2**

PHARMACEUTICAL INORGANIC CHEMISTRY LAB (PH0245)

List of experiments:

A) Limit tests for the following as per the procedure given in Indian Pharmacopoeia (1996 – Including the latest addenda)

1. Chlorides
2. Sulphates
3. Heavy metals
4. Iron
5. Arsenic (demonstration)

B) Balances and Weighing; Calibration of weights, Pipette and Burette.

1. Preparation and standardization of Hydrochloric acid solution (0.1N).
2. Preparation and standardization of Potassium permanganate solution (0.1N & 0.1M).
3. Preparation of a primary standard solution of 0.1N Potassium hydrogen-phthalate.
4. Preparation and standardization of 0.1N EDTA solution.
5. Preparation and purification of Boric acid.
6. Preparation and purification of Sodium citrate.
7. Preparation and purification of Potash alum.
8. Preparation and purification of Magnesium stearate.
9. Assay of sodium bicarbonate and assay of Boric acid (Neutralization).
10. Assay of Calcium gluconate (or) any calcium compounds (Complexometry).
11. Assay of Copper sulphate (Redox titration).
12. Assay of Sodium acetate (Non-aqueous titration).
13. Assay of Ferrous sulphate (Oxidation-reduction / Redox titration).
14. Exercises related to assay by Gravimetric method.

REFERENCES

1. Indian Pharmacopoeia - 2010.
2. Vogel's Qualitative Analysis

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

I Year B. Pharm II-Sem	**L**	**P**	**C**
	-	**3**	**2**

STATISTICAL METHODS AND COMPUTER APPLICATIONS LAB (HM0216)

1. **Solving biostatistics problems** related to inference, sampling, graphical representation of data etc., with the help of calculators & software programs like Graph-pad.

2. **Sample programs in C**: Program to calculate simple and complex arithmetic expressions, program using structures, program using loops and nested loops, program using functions and simple programs using arrays.

3. **Operating systems** like WINDOWS, UNIX, etc.

4. **Software packages** like MS-WORD, EXCEL, ACCESS, and POWER POINT.

GURU NANAK INSTITUTIONS TECHNICAL CAMPUS (AUTONOMOUS)

I Year B. Pharm II-Sem	**L**	**P**	**C**
	-	**3**	**2**

PHYSICAL PHARMACY – I LAB (PH0246)

1. Percent composition determination by Capillary Flow method
2. Percent composition determination by polarimeter & refractometer
3. Molecular weight determination by Landsberger method.
4. Molecular weight determination by Rast camphor method.
5. Calibration of pH Meter
6. pH Estimation – pH meter
7. pH Estimation – colourimetric method.
8. pH Estimation by Half Neturalization Method
9. Refractive index of liquids.
10. Molar refraction determination
11. Effect of dielectric constant on the solubility of the drug.
12. Phenol water system – CST
13. Lower consolute temperature – Tirethanol amine and Water
14. Heat of neutralization
15. Phase diagram - Phenol – Water, Effect of Impurities.
16. Ternary phase diagram.
17. Preparation of Buffers and Buffer Capacity Determination.

REFERENCES:

1. Physical pharmacy practical book by C.V.S. Subramanyam
2. Physical pharmacy practical text by Guru Prasa Mohanta, Prabal Kumar Manne